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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/046,282	01/16/2002	Chul-Hwan Choi	SEC.863	3589

7590

04/27/2004

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EXAMINER

PHAM, MINH CHAU THI

ART UNIT

PAPER NUMBER

1724

DATE MAILED: 04/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/046,282	CHOI ET AL.	
	Examiner	Art Unit	
	Minh-Chau T. Pham	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Note: the current office action replaces the notice of allowance mailed October 1, 2003.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 11 is rejected under 35 U.S.C. 102(e) as being clearly anticipated by Yelverton et al(6536460)(note column 5 lines 3-10).

Yelverton et al teaches a method of removing a residual gas remaining in a gas inlet line(12) connecting a mass flow controller(16) and a chamber(20), the method comprising providing a low stress valve(18) at one end of the gas inlet line and in flow communication therewith, closing the low stress valve to cut off the gas supply between the mass flow controller and the chamber, thereby leaving a residual gas in the gas inlet line, opening a vent valve(62) connected to another end of the gas inlet line(12), and pumping the residual gas(vacuum pump 48) through the vent valve and into the atmosphere(vent 24).

Claims 12-16 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Yelverton et al(6536460)(note column 5 lines 3-10).

Yelverton et al teaches a semiconductor device fabricating facility having a processing chamber(20), the combination of a gas supply apparatus that supplies processing gas to the processing chamber, and a residual gas removing system that removes residual gas from the gas supply apparatus, wherein the gas supply apparatus comprises a plurality of sources of gas(10,26) including at least one source of process gas(10), a low stress valve(18) through which the plurality of sources of gas are connected to the processing chamber, the low stress valve being operative to selectively cut off and allow the supply of gas to the processing chamber, a mass flow controller(16) having an inlet connected to the source of process gas and an outlet, and a gas inlet line(12) connecting the outlet of the mass flow controller to the low stress valve, and wherein the residual gas removing system is in gas flow communication with the gas inlet line, and the residual gas removing system is vented(vent valve 62) to an environment outside of the gas supply apparatus, such that residual gas in the gas inlet line leading to the low stress valve can be removed from the gas inlet line.

Yelverton et al further teaches wherein the residual gas removing system is connected to the gas inlet line upstream of the low stress valve with respect to the gas supply apparatus, and the residual gas removing system comprises a vent valve(62) and a pump(48) connected to the vent valve so as to pump residual gas through the vent valve. Yelverton et al further teaches wherein the plurality of sources of gas

includes a source of WF6(column 2 line 12). Yelverton et al further teaches wherein the plurality of sources of gas also includes a source of inert carrier gas(26).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over prior art figure 1 taken together with Yelverton et al(6536460)(note column 5 lines 3-10).

Prior art figure 1 discloses all of the limitations of claim 11 but is silent as to steps of closing the low stress valve to cut off the gas supply between the mass flow controller and the chamber, thereby leaving a residual gas in the gas inlet line, opening a vent valve connected to another end of the gas inlet line, and pumping the residual gas through the vent valve and into the atmosphere. Yelverton et al teaches a method of removing a residual gas remaining in a gas inlet line(12) connecting a mass flow controller(16) and a chamber(20), the method comprising providing a low stress valve(18) at one end of the gas inlet line and in flow communication therewith, closing the low stress valve to cut off the gas supply between the mass flow controller and the chamber, thereby leaving a residual gas in the gas inlet line, opening a vent valve(62) connected to another end of the gas inlet line(12), and pumping the residual gas(vacuum pump 48) through the vent valve and into the atmosphere(vent 24). It would have been obvious to someone of ordinary skill in the art at the time of the

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invention to include steps of closing the low stress valve, opening a vent valve, and pumping residual gas of prior art figure 1 through the vent valve in order to prevent residual gas from being contained within the gas inlet line.

Claims 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art figure 1 taken together with Yelverton et al(6536460)(note column 5 lines 3-10).

Prior art figure 1 discloses all of the limitations of claim 12 but is silent as to a residual gas removing system that removes residual gas from the gas supply apparatus, wherein the residual gas removing system is in gas flow communication with the gas inlet line, and the residual gas removing system is vented to an environment outside the gas supply apparatus. Yelverton et al teaches a semiconductor device fabricating facility having a processing chamber(20), the combination of a gas supply apparatus that supplies processing gas to the processing chamber, and a residual gas removing system that removes residual gas from the gas supply apparatus, wherein the gas supply apparatus comprises a plurality of sources of gas(10,26) including at least one source of process gas(10), a low stress valve(18) through which the plurality of sources of gas are connected to the processing chamber, the low stress valve being operative to selectively cut off and allow the supply of gas to the processing chamber, a mass flow controller(16) having an inlet connected to the source of process gas and an outlet, and a gas inlet line(12) connecting the outlet of the mass flow controller to the low stress valve, and wherein the residual gas removing system is in gas flow communication with the gas inlet line, and the residual gas removing system is vented(vent valve 62) to an environment outside of the gas supply apparatus, such that residual gas in the gas inlet

line leading to the low stress valve can be removed from the gas inlet line. It would have been obvious to someone of ordinary skill in the art at the time of the invention to provide a residual gas removing system connected to the gas supply apparatus of prior art figure 1 in order to prevent residual gas from being contained within the gas inlet line.

Allowable Subject Matter

Claim 17 is allowed.

Yelverton et al teaches a method of forming a tungsten silicide film comprising disposing a substrate in a process chamber(20), the substrate having a film thereon comprising silicon, subsequently opening a low stress valve(18) having an outlet end connected to the process chamber, and an inlet end connected to a plurality of sources of gases(10,26) via a gas inlet line(12), the sources of gas including a source of WF6 gas and a source of inert carrier gas, controlling the flow of WF6 gas through the open low stress valve and into the process chamber using a mass flow controller(16) disposed between the gas inlet line and source of WF6 gas, subsequently closing the low stress valve to cut off the supply of WF6 gas into the process chamber, subsequently venting(through vent valve 62) the gas inlet line to remove residual WF6 gas therefrom, and subsequently opening the low stress valve. However Yelverton et al allows inert carrier gas to flow through vacuum conduit 60 and vent valve 62 to pump 48, instead of opening the low stress valve to allow inert carrier gas to flow into the process chamber.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Minh-Chau T. Pham whose telephone number is (571) 272-1163. The examiner can normally be reached on Mon/Tues/Thur/Fri 7:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Minh-Chau Pham
Patent Examiner
Art Unit: 1724
April 2, 2004



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